



THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Application of :
Katsuyuki IGARASHI et al. :
Appln. No. 10/535,152 : Art Unit: 2809
Filed: May 16, 2005 : Examiner: Lauren Nguyen
For: LIQUID CRYSTAL
DISPLAY DEVICE : Docket No. S004-5557 (PCT)

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MS Amendment
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL RESPONSE

S I R:

In further response to the Office Action mailed January 30, 2007, and supplementing the response filed by mailing certificate dated July 2, 2007, applicants further amend their application as follows:

ADDITIONAL FEE:

No additional fee is believed required in connection with this supplemental response. However, should it be determined that a fee is due, authorization is hereby given to charge any such fee to our Deposit Account No. 01-0268.

MAILING CERTIFICATE ON PAGE 12

IN THE SPECIFICATION:

Paragraph beginning at line 3 on page 13 has been amended as follows:

After that, the reflective film 4 in an arbitrary shape or pattern is formed so that regions or areas thereof overlie corresponding regions or areas on the surface of the colored layers (3R, 38, and 3B). A metal film containing Al or Ag is generally used as the reflective film 4. Such a metal film is formed to have a thickness of about 1000 to 1500 Å by sputtering or the like. In order to improve the adherence between the colored layer and the reflective film 4, a transparent insulating film 10 made of SiO₂, TiO₂, or the like may be formed between the colored layer and the reflective film. Since the transparent insulating film 10 can be formed in succession to the reflective film 4, it is not necessary to increase the number of process steps to, for example, move a workpiece or change a chamber.

**Paragraph beginning at line 18 on page 14 has been amended
as follows:**

Fig. 2 schematically illustrates liquid crystal display elements used in a liquid crystal display device of this embodiment. This embodiment differs from Embodiment 1 in that the reflective film 4 is provided on the planarizing film 5. Description of portions the same as those of Embodiment 1 is omitted as appropriate. Fig. 2 (A) is a view illustrating a structure in section of the liquid crystal display elements of this embodiment. Fig. 2 (B) is a schematic view seen from the direction for viewing a display element for one pixel illustrated in Fig. 2 (A). Here, one pixel for red is enlarged and illustrated. More specifically, a color filter substrate 1 has a structure in which a light shielding film (black matrix) 2 and a color filter formed of colored layers (3R, 3G, and 3B) are formed on a glass substrate. Typically, the color filter is provided at the thickness of about 1 μm . The planarizing film 5 is provided on the color filter and the reflective film 4 is provided on the planarizing film 5. If necessary, a transparent insulating film 10 is formed on the planarizing film 5, and the reflective film 4 is formed thereon. Here, the reflective film 4 is formed at regions that correspond to the positions or regions of the colored layers (3R, 3G, and 3B) of the color filter. Fig. 2 (B) shows an example where the reflective film 4 is formed at a place

which corresponds to and overlies a center portion of the colored layer. Therefore, similarly to the case of Embodiment 1, light incident on reflective regions where the reflective film is formed is reflected to the front face of a display portion without passing through the colored layers, and returns to the side of a viewer without being absorbed in the colored layers, and thus, bright display is obtained. In other words, bright display can be achieved when viewed in the reflection mode.